

Ms. Anne Heighway  
Indianapolis Power & Light Company  
1230 West Morris Street  
Indianapolis, Indiana 46221

Re: Registered Construction and Operation  
Status, 4812 South Bridgeport Road  
(Thompson Substation) R097-12024-00377

Dear Ms. Heighway:

The application from Indianapolis Power & Light Company (IPL), received on March 14, 2000, has been reviewed. Based on the data submitted and the provisions in IAPCB Regulation 2 (Permits) and state regulations 326 IAC 2-5.1-2, it has been determined that the following generators, to be located at Thompson Substation, 4812 South Bridgeport Road, Indianapolis, Indiana, are classified as registered as of the date of this letter. This Registration shall expire September 30, 2000.

- (a) Two (2) Cummins diesel fired portable generators identified as Emission Unit ID C1 and C2. Each generator is an internal combustion engine rated at 1250 kilowatts or 1635 brake horsepower with a maximum hourly diesel fuel consumption rate of 74.5 gallons per hour. With a contractually obligated maximum annual leased engine operating hours for each engine of 190 hours per year.
- (b) Four (4) Cummins diesel fired portable generators identified as Emission Unit ID C3, C4, C5 and C6. Each generator is an internal combustion engine rated at 900 kilowatts or 1220 brake horsepower with a maximum hourly diesel fuel consumption rate of 54.6 gallons per hour. With a contractually obligated maximum annual leased engine operating hours for each engine of 190 hours per year.
- (c) Five (5) Cummins diesel fired portable generators identified as Emission Unit ID C7, C8, C9, C10 and C11. Each generator is an internal combustion engine rated at 750 kilowatts or 1030 brake horsepower with a maximum hourly diesel fuel consumption rate of 51.9 gallons per hour. With a contractually obligated maximum annual leased engine operating hours for each engine of 190 hours per year.

The following conditions shall be applicable:

- 1. Pursuant to IAPCB Regulation 5-1-2 (Smoke and Other Visible Emissions) and 326 IAC 5-1-2 (Opacity Limitations) except as provided in 326 IAC 5-1-3 (Temporary Alternative Opacity Limitations), opacity shall meet the following:
  - (a) Opacity shall not exceed an average of thirty percent (30%) in any one (1)

six (6) minute averaging period as determined in 326 IAC 5-1-4.

- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of 15 minutes (60 readings) in a 6-hour period as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor in a six (6) hour period.
- 2. Each generator shall be equipped with a Diehl 120 volt timer, 60 hertz timer on the output side of each generator. The timer shall operate anytime the associated generator operates. The timer shall be powered by the associated generator and record the cumulative run time (hours and minutes) for each unit. Each timer shall be programmed by Cummins Mid-States personnel prior to delivery and allow the associated generator to operate up to the specified number of hours of 190. Once the number of hours are reached, the timer contacts shall close and the associated generator shall cease operation. Each timer shall be located on a locked cabinet that can only be accessed by Cummins Mid-State personnel.
- 3. IPL shall arrange, through Cummins Mid-State, for access for personnel from Environmental Resources Management Division and the Office of Air Management to inspect the Diehl timer and the associated generator to verify cumulative run time. In addition, IPL shall notify ERMD at least two (2) business days before the generators will be removed from the site approved in this registration to allow a final inspection of the Diehl timers and the associated generator.
- 4. Pursuant to IAPCB Regulation 2-6 (Annual emission statement rule) and state regulation 326 IAC 2-6 (Emission Reporting), an authorized individual shall provide an annual emission statement to the Environmental Resources Management Division and the Office of Air Management at the addresses listed below no later than April 15, 2001.

**Technical Support and Modeling**

**Office of Air Management**

**100 North Senate Avenue**

**P.O. Box 6015**

**Indianapolis, Indiana 46206-6015**

and

**Environmental Resources Management Division**

**Air Quality Management Section, Compliance Data Group**

**2700 South Belmont Avenue**

**Indianapolis, Indiana 46221-2097**

- 5. Pursuant to IAPCB Regulation 2 (Permits) and state regulation 326 IAC 2-5.1-2(f)(3), an authorized individual shall provide an annual notice to the Environmental Resources Management Division and the Office of Air Management that the source is in compliance with this registration at the addresses listed below, in the format attached, no later than April 15, 2001.

**Compliance Data Section**

**Office of Air Management**

**100 North Senate Avenue  
P.O. Box 6015  
Indianapolis, IN 46206-6015  
and  
Environmental Resources Management Division  
Air Quality Management Section, Compliance Data Group  
2700 South Belmont Avenue  
Indianapolis, Indiana 46221-2097**

This registration is the first air approval issued to this source. The source may operate according to IAPCB Regulation 2 (Permits) and state regulation 326 IAC 2-5.5.

Sincerely,

David S. Foster  
Project Manager  
Environmental Resources Management Division

Sincerely,

Mona A. Salem  
Chief Operating Officer  
Department of Public Works  
City of Indianapolis

df

enclosures

cc w/enclosures:

Mark Caraher, Permits Program Manager  
Matt Mosier, Compliance Program Manager  
Cheryl Carlson, Enforcement Program Manager  
Mindy Hahn, IDEM  
Gail McGarrity, IDEM

<b>Registration Annual Notification</b>
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This form should be used to comply with the notification requirements under IAPCB Regulation 2 (Permits) and 326 IAC 2-5.1-2(f)(3)

<b>Company Name:</b>	<b>Indianapolis Power &amp; Light Company (Thompson Substation)</b>
<b>Address:</b>	<b>1230 West Morris Street (4812 South Bridgeport Road)</b>
<b>City:</b>	<b>Indianapolis, IN 46221</b>
<b>Authorized individual:</b>	
<b>Phone #:</b>	
<b>Registration #:</b>	<b>R097-12024-00377</b>

I hereby certify that Indianapolis Power & Light Company is in compliance with the requirements of Registration R097-12024-00377.

<b>Name (typed):</b>
<b>Title:</b>
<b>Signature:</b>
<b>Date:</b>

# **Indianapolis Environmental Resources Management Division Air Quality Management Section**

and

## **Indiana Department of Environmental Management Office of Air Management**

### **Technical Support Document (TSD) for a Registration**

#### **Source Background and Description**

Source Name: Indianapolis Power & Light Company  
Source Location: Thompson Substation - 4812 South Bridgeport Road  
Indianapolis, IN  
County: Marion  
Registration No.: R097-12024-00377  
SIC: 4911  
Permit Reviewer: David Foster

The City of Indianapolis Environmental Resources Management Division (ERMD) has reviewed an application received from Indianapolis Power & Light Company on March 13, 2000 relating to the operation of portable diesel generators at the above referenced location under a Standard Industrial Classification Code (SIC) of 4911 (establishments engaged in the generation, transmission, and/or distribution of electric energy for sale).

#### **New Emission Units and Pollution Control Equipment**

The source consists of the following emission units and pollution control devices:

- (a) Two (2) Cummins diesel fired portable generators identified as Emission Unit ID C1 and C2. Each generator is an internal combustion engine rated at 1250 kilowatts or 1635 brake horsepower with a maximum hourly diesel fuel consumption rate of 74.5 gallons per hour. With a contractually obligated maximum annual leased engine operating hours for each engine of 190 hours per year.
- (b) Four (4) Cummins diesel fired portable generators identified as Emission Unit ID C3, C4, C5 and C6. Each generator is an internal combustion engine rated at 900 kilowatts or 1220 brake horsepower with a maximum hourly diesel fuel consumption rate of 54.6 gallons per hour. With a contractually obligated maximum annual leased engine operating hours for each engine of 190 hours per year.
- (c) Five (5) Cummins diesel fired portable generators identified as Emission Unit ID C7, C8, C9, C10 and C11. Each generator is an internal combustion engine rated at 750 kilowatts or 1030 brake horsepower with a maximum hourly diesel fuel consumption rate of 51.9 gallons per hour. With a contractually obligated maximum annual leased engine operating hours for each engine of 190 hours per year.

#### **Unpermitted Emission Units and Pollution Control Equipment**

There are no previously unpermitted facilities operating at this source during this review process.

## Existing Approvals

There are no approvals previously issued to this source operating at this source during this review process.

## Air Pollution Control Justification as an Integral Part of the Process

The company has submitted the following justification such that the timers be considered as an integral part of the generators:

- (a) The amount of hours each generator can be operated will be governed by an operating agreement between Cummins Mid-States, the supplier of the leased generators, and Indianapolis Power & Light, the operator of the generators.
- (b) As part of that operating agreement, Cummins Mid-States will place a Diehl 120volt, 60 hertz timer on the output side of each generator.
- (c) The timer will be powered by the associated generator and record the cumulative run time (hours and minutes) for each unit.
- (d) Each timer will be programmed by Cummins Mid-States personnel prior to delivery to allow the associated generator to operate up to a specified number of hours.
- (e) Once the specified number of hours is reached, the contacts on the timer will close and the generator will cease operation.
- (f) Each timer will be located in a locked cabinet that can only be accessed by Cummins Mid-States personnel.

IDEM, OAM and ERMD have evaluated the justifications and agreed that the timers will be considered as an integral part of the generators. Therefore, the permitting level will be determined using the potential to emit after the timers. Operating conditions in the proposed permit will specify that the timers shall operate at all times when the generator is in operation.

## Stack Summary

Stack ID	Operation	Height (feet)	Diameter* (Inches)	Flow Rate (acfm)	Temperature (°F)
C1	Generator	13.5	26.2	8400	860
C2	Generator	13.5	26.2	8400	860
C3	Generator	13.5	26.2	8400	860
C4	Generator	13.5	26.2	8400	860
C5	Generator	13.5	26.2	8400	860
C6	Generator	13.5	26.2	8400	860
C7	Generator	13.5	26.2	8400	860
C8	Generator	13.5	26.2	8400	860
C9	Generator	13.5	26.2	8400	860
C10	Generator	13.5	26.2	8400	860
C11	Generator	13.5	26.2	8400	860

\* Effective Diameter

Given: 2 stacks of 18.5 inches diameter each

Determine individual stack areas:

$$3.142 \times (18.50 \text{ inches}/2)^2 = 3.142 \times 85.56 \text{ inches radius} = 268.8 \text{ sq. inches area}$$

Determine total stack area:

268.8 sq. inches area + 268.8 sq. inches area = 537.6 sq. inches total area  
Determine effective stack radius:  
 $537.6 \text{ sq. inches total area} / 3.142 = \text{square root of } 171.1 \text{ sq. inches} = 13.08 \text{ inches radius}$   
Determine effective stack diameter:  
 $13.08 \text{ inches radius} \times 2 = 26.16 \text{ inches diameter}$

### Enforcement Issue

There are no enforcement actions pending.

### Recommendation

The staff recommends to the Administrator that the operation be approved. This recommendation is based on the following facts and conditions:

Unless otherwise stated, information used in this review was derived from the application and additional information submitted by the applicant.

An application for the purposes of this review was received on March 13, 2000, with additional information received on March 16, 22 and 27, 2000.

### Emission Calculations

See Appendix A of this document for detailed emissions calculations. Appendix A, Page 3 of 5 shows that manufacturer's emission estimates coincide with AP-42 emission factors except that manufacturer supplied NOx emission factors are slightly higher. As a result, manufacturer emission estimates were used to determine potential to emit.

### Potential To Emit

Pursuant to 326 IAC 2-1.1-1(16), Potential to Emit is defined as "the maximum capacity of a stationary source or emissions unit to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or type or amount of material combusted, stored, or processed shall be treated as part of its design if the limitation is enforceable by the U. S. EPA, the department, or the appropriate local air pollution control agency."

Pollutant	Potential To Emit (tons/year)*
PM	0.9
PM-10	0.9
SO <sub>2</sub>	0.5
VOC	0.6
CO	1.9
NO <sub>x</sub>	24.3
HAP's	Potential To Emit (tons/year)*
Combination	1.23E-02
TOTAL	1.23E-02

\*based on 190 hours/yr operation

- (a) This source is **not** a major stationary source because no attainment regulated pollutant is emitted at a rate of 250 tons per year or more, and it is not in one of the 28 listed source categories. Therefore the requirements of 326 IAC 2-5 apply.
- (b) Fugitive Emissions

Since this type of operation is not one of the twenty-eight (28) listed source categories under 326 IAC 2-2 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD and Emission Offset applicability.

### Actual Emissions

Because this source is a new Registration, no previous actual emission data from this source was required to be submitted or was received.

### County Attainment Status

The source is located in Marion County.

Pollutant	Status
PM-10	attainment
SO <sub>2</sub>	attainment
NO <sub>2</sub>	attainment
Ozone	attainment
CO	attainment
Lead	attainment

- (a) Volatile organic compounds (VOC) and oxides of nitrogen (NO<sub>x</sub>) are precursors for the formation of ozone. Therefore, VOC emissions are considered when evaluating the rule applicability relating to the ozone standards. Marion County has been designated as attainment or unclassifiable for ozone. Therefore, VOC and NO<sub>x</sub> emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (b) Marion County has been classified as attainment or unclassifiable for PM-10, SO<sub>2</sub>, NO<sub>2</sub>, Ozone, CO, and Lead. Therefore, these emissions were reviewed pursuant to the requirements for Prevention of Significant Deterioration (PSD), 326 IAC 2-2 and 40 CFR 52.21.
- (c) Fugitive Emissions  
 Since this type of operation is not one of the 28 listed source categories under 326 IAC 2-2, 40 CFR 52.21, or 326 IAC 2-3 and since there are no applicable New Source Performance Standards that were in effect on August 7, 1980, the fugitive particulate matter (PM) and volatile organic compound (VOC) emissions are not counted toward determination of PSD and Emission Offset applicability.

### Source Status

Pollutant	Emissions (ton/yr)
PM	0.2
PM10	0.2
SO <sub>2</sub>	0.8
VOC	0.6
CO	0.4
NO <sub>x</sub>	24.3

- (a) This source is not a major stationary source because no attainment regulated pollutant is



emitted at a rate of 250 tons per year or more, and it is not in one of the 28 listed source categories.

- (b) This source has nitrogen oxide(s) (NO<sub>x</sub>) potential to emit of greater than ten (10) tons per year but less than twenty five (25) tons per year. Therefore, the source qualifies at Registration status and is required to obtain a Registration pursuant to 326 IAC 2-5.1-2 Construction of New Sources; Registrations.

## **Part 70 Permit Determination**

### **326 IAC 2-7 (Part 70 Permit Program)**

This new source is not subject to the Part 70 Permit requirements because the potential to emit (PTE) of:

- (a) each criteria pollutant is less than 100 tons per year,
- (b) a single hazardous air pollutant (HAP) is less than 10 tons per year, and
- (c) any combination of HAPs is less than 25 tons/year.

This is the first air approval issued to this source.

## **Federal Rule Applicability**

- (a) This electrical generating substation is not subject to the New Source Performance Standards (NSPS) as there are no applicable NSPS for reciprocating internal combustion generators.
- (b) This electrical generating substation is not subject to the National Emission Standards for Hazardous Air Pollutants (NESHAPs) as there are no applicable NESHAP for reciprocating internal combustion generators.

## **State and Local Rule Applicability - Entire Source**

### **IAPCB Regulation 2 (Permits) and 326 IAC 2-5 (Registration Content)**

Pursuant to IAPCB Regulation 2 (Permits) and 326 IAC 2-5.5-4 (Registration Content), an authorized individual shall provide a one-time notice to the Environmental Resources Management Division and the Office of Air Management that the source is in compliance with this registration pursuant to 326 IAC 2-5.5-4(a)(3). This registration will expire September 30, 2000.

### **326 IAC 2-2 (Prevention of Significant Deterioration (PSD) Requirements)**

This source will install eleven (11) temporary diesel generators. Potential to Emit any regulated pollutant has been determined to not be in excess of 250 tons per year (see TSD Appendix A, Page 3 of 5) based on 225 annual operating hours. Therefore, the PSD requirements do not apply to this source.

### **326 IAC 2-5.1-2 (Registrations)**

This source will install eleven (11) temporary diesel generators with integral hour limitations. Therefore, this source qualifies as Registration level pursuant 326 IAC 2-5.1-2 (Registrations). Potential to Emit NO<sub>x</sub> has been determined to be within the thresholds of less than 25 tons per year and equal to, or greater than, 10 (ten) tons per year. The source

is seeking a registration permit under 326 IAC 2-5.5.

#### IAPCB Regulation 2-6 (Annual emission statement rule) and 326 IAC 2-6 (Emission Reporting)

This source is subject to 326 IAC 2-6 (Emission Reporting), because it has the potential to emit more than ten (10) tons per year of NO<sub>x</sub> in Marion County. Pursuant to this rule, the owner/operator of the source must submit an annual emission statement for the source. The permit will be issued for a period of one (1) year. The annual statement must be received by April 15, 2001, and contain the minimum requirement as specified in 326 IAC 2-6-4. The submittal should cover the period defined in 326 IAC 2-6-2(8)(Emission Statement Operating Year).

#### 326 IAC 2-7 (Part 70 Permit Program)

This source will install ten (10) temporary diesel. Potential to Emit any regulated pollutant has been determined to not be in excess of major source threshold (see TSD Appendix A, Page 3 of 5) based on 190 annual operating hours. Potential to emit HAP is also less than any major source threshold. Therefore, the Part 70 Program requirements do not apply to this source.

#### 326 IAC 2-8 (Federally Enforceable State Operating Permit Program)

This source will install eleven (11) temporary diesel generators. Potential to Emit any regulated pollutant has been determined to not be in excess of major source threshold (see TSD Appendix A, Page 3 of 5) based on 190 annual operating hours. Potential to emit HAP is also less than any major source threshold. Therefore, the Federally Enforceable State Operating Permit Program requirements do not apply to this source.

#### 326 IAC 5-1 (Opacity Regulations)

Pursuant to 326 IAC 5-1-2 (Opacity Limitations), except as provided in 326 IAC 5-1-3 (Temporary Exemptions), opacity shall meet the following, unless otherwise stated in this permit:

- (a) Opacity shall not exceed an average of thirty percent (30%) any one (1) six (6) minute averaging period as determined in 326 IAC 5-1-4.
- (b) Opacity shall not exceed sixty percent (60%) for more than a cumulative total of fifteen (15) minutes (sixty (60) readings) as measured according to 40 CFR 60, Appendix A, Method 9 or fifteen (15) one (1) minute nonoverlapping integrated averages for a continuous opacity monitor) in a six (6) hour period.

### **State and Local Rule Applicability - Individual Facilities**

#### 326 IAC 6 (Particulate Rules)

The source consists of eleven (11) temporary generators powered by reciprocating internal combustion engines combusting diesel fuel. Potential to emit PM is calculated to be less than ten (10) tons per year. Therefore, no PM limit for these units is established pursuant to 326 IAC 6-1 (Nonattainment Area Limitations) or 326 IAC 6-2 (Particulate Emission Limitations for Sources of Indirect Heating). Pursuant to 326 IAC 1-2-59 (Definitions), liquid and gaseous fuels and combustion air will not be considered as part of the process weight in determining applicability of 326 IAC 6-3 (Process Operations). Therefore, 326 IAC 6-3 (Process Operations) does not apply to liquid fuel fired generators at this source.

### 326 IAC 7 (Sulfur Dioxide Rules)

Neither the source nor any individual generator has potential to emit sulfur dioxide in excess of twenty five (25) tons per year. Therefore, 326 IAC 7 (Sulfur Dioxide Rules) does not apply.

### 326 IAC 8 (Volatile Organic Compounds)

The source wide VOC emissions are less than 25 tons per year. Therefore, 326 IAC 8-1-6 (New Facilities; General provisions relating to VOC rules: general reduction requirements for new facilities) does not apply to this source.

## Air Toxic Emissions

Indiana presently requests applicants to provide information on emissions of the 188 hazardous air pollutants (HAPs) set out in the Clean Air Act Amendments of 1990. These pollutants are either carcinogenic or otherwise considered toxic and are commonly used by industries. They are listed as air toxics on the Office of Air Management (OAM) Construction Permit Application Form Y.

This new operation will emit levels of air toxics less than those which constitute a major source according to Section 112 of the 1990 Amendments to Clean Air Act.

An ISC model analysis was performed by IDEM and ERMD to determine the HAP concentrations. According to the preliminary hazard screening, the HAP concentrations were all well below their respective levels for one (1) in a million lifetime risk for developing cancer (see TSD Appendix A Page 5 of 5).

See spreadsheets (Appendix A, Page 4 of 5) for detailed air toxic calculations.

## Conclusion

The operation of Indianapolis Power & Light Company (Thompson Substation) shall be subject to the conditions of the attached proposed Registration R097-12024-00377.

## **APPENDIX A**

Portable Diesel Generators (>600 HP)  
Five 750 kW Units Using Mfr's Emission Factors  
Company Name: Indianapolis Power & Light (Thompson Substation)  
Address City IN Zip: 4812 South Bridgeport Road, Indpls., IN  
Permit #: R097-12024-00377  
Reviewer: D. Foster  
Date: 03/17/00

**A. Comparison of AP-42 Emissions Factors and Mfr's Emission Factors.**

	Pollutant					
	PM 0.1	PM10** 0.0573	SO2 0.1 (1.01S)	NOx 3.2	VOC 0.1	CO 0.85
AP-42 Emission Factor in lb/MMBtu						
AP-42 Emission Factor in lb/HP-hr*	2.54E-04	1.46E-04	1.28E-04	8.14E-03	2.29E-04	2.16E-03
Mfr's Emission Factors in lb/HP-hr	1.98E-04	1.98E-04 **not provided	4.05E-04	1.81E-02	5.07E-04	2.65E-04

\* using AP-42 conversion factor of 2,542.5 Btu/HP

**B. Emissions calculated based on Mfr's Data for 5 Units**

Heat Input Capacity Potential Throughput S= 0.05 = WEIGHT % SULFUR  
Horsepower (hp) hp-hr/yr

5150.0 978500.0  
1030\*5=5150

	Pollutant					
	PM* 1.98E-04	PM10** 1.98E-04 **not provided	SO2 4.05E-04 (.00809S)	NOx* 1.81E-02	VOC* 5.07E-04	CO* 2.65E-04
Emission Factor in lb/HP-hr						
Potential Emission in tons/yr	0.1	0.1	0.2	8.9	0.2	0.1

\*PM, NOx, VOC, and CO emission factors provided by manufacturer

**Methodology**

Potential Throughput (hp-hr/yr) = hp \* 190 hr/yr

\*No information was given regarding which method was used to determine the PM emission factor or whether condensable PM is included. The PM10 emission factor is filterable and condensable PM10 combined.

icdsl600.wk4 9/95

Portable Diesel Generators (>600 HP)  
Four 900 kW Units Using Mfr's Emission Factors  
Company Name: Indianapolis Power & Light (Thompson Substation)  
Address City IN Zip: 4812 South Bridgeport Road, Indpls., IN  
Permit #: R097-12024-00377  
Reviewer: D. Foster  
Date: 03/17/00

A. Comparison of AP-42 Emissions Factors and Mfr's Emission Factors.

	Pollutant					
	PM 0.1	PM10** 0.0573	SO2 0.1 (1.01S)	NOx 3.2	VOC 0.1	CO 0.85
AP-42 Emission Factor in lb/MMBtu						
AP-42 Emission Factor in lb/HP-hr*	2.54E-04	1.46E-04	1.28E-04	8.14E-03	2.29E-04	2.16E-03
Mfr's Emission Factors in lb/HP-hr	1.76E-04	1.76E-04 **not provided	4.05E-04	1.60E-02	3.97E-04	3.97E-04

\* using AP-42 conversion factor of 2,542.5 Btu/HP

B. Emissions calculated based on output rating (hp) For 4 Generators at 190 Hours Each

Heat Input Capacity                      Potential Throughput                      S= 0.05 = WEIGHT % SULFUR  
Horsepower (hp)                      hp-hr/yr

4880.0                      927200.0  
1220\*4=4880

	Pollutant					
	PM* 1.76E-04	PM10** 1.76E-04 **not provided	SO2 4.05E-04 (.00809S)	NOx* 1.60E-02	VOC* 3.97E-04	CO* 3.97E-04
Emission Factor in lb/hp-hr						
Potential Emission in tons/yr	0.1	0.1	0.2	7.4	0.2	0.2

\*PM, NOx, VOC, and CO emission factors provided by manufacturer

Methodology

Potential Througput (hp-hr/yr) = hp \* 190 hr/yr

\*No information was given regarding which method was used to determine the PM emission factor or whether condensable PM is included. The PM10 emission factor is filterable and condensable PM10 combined.

**Appendix A: Emission Calculations**  
**Internal Combustion Engines - Diesel Fuel**

Page 2a of 5 TSD App A

**Portable Diesel Generators (>600 HP)**  
**Two 1250 kW Units Using Mfr's Emission Factors**  
**Company Name:** Indianapolis Power & Light (Thompson Substation)  
**Address City IN Zip:** 4812 South Bridgeport Road, Indpls., IN  
**Permit #:** R097-12024-00377  
**Reviewer:** D. Foster  
**Date:** 03/17/00

**A. Comparison of AP-42 Emissions Factors and Mfr's Emission Factors.**

	Pollutant					
	PM	PM10**	SO2	NOx	VOC	CO
AP-42 Emission Factor in lb/MMBtu	0.1	0.0573	0.1 (1.01S)	3.2	0.1	0.85
AP-42 Emission Factor in lb/HP-hr*	2.54E-04	1.46E-04	1.28E-04	8.14E-03	2.29E-04	2.16E-03
Mfr's Emission Factors in lb/HP-hr	1.76E-04	1.76E-04 **not provided	1.26E-03	2.58E-02	3.97E-04	3.97E-04

\* using AP-42 conversion factor of 2,542.5 Btu/HP

**B. Emissions calculated based on output rating (hp) For 2 Generators at 190 Hours Each**

Heat Input Capacity                      Potential Throughput                      S= 0.05 = WEIGHT % SULFUR  
Horsepower (hp)                              hp-hr/yr

3268.0                      620920.0  
1634\*2=3268

	Pollutant					
	PM*	PM10**	SO2*	NOx*	VOC*	CO*
Emission Factor in lb/hp-hr	1.76E-04	1.76E-04 **not provided	1.26E-03	2.58E-02	3.97E-04	3.97E-04
Potential Emission in tons/yr	0.1	0.1	0.4	8.0	0.1	0.1

\*PM, SO2, NOx, VOC, and CO emission factors provided by manufacturer

**Methodology**

Potential Throughput (hp-hr/yr) = hp \* 190 hr/yr

\*No information was given regarding which method was used to determine the PM emission factor or whether condensable PM is included. The PM10 emission factor is filterable and condensable PM10

Portable Diesel Generators (>600 HP)  
Comparison of Emissions per Source's and AP-42  
Company Name: Indianapolis Power & Light (Thompson Substation)  
Address City IN Zip: 4812 South Bridgeport Road, Indpls., IN  
Permit #: R097-12024-00377  
Reviewer: D. Foster  
Date: 03/17/00

Per IPL Data					AP-42 Conversions Factors			Number of Engines
Unit ID	Unit Size	Gal/hr	Btu/Gal	MMBtu/hr	HP/kW	Btu/HP	HP elect./HP mech.	
750DFHA	1030 BHP	51.9	137,950	7.2	1.3407	2,542.5	0.9996	5
900DFHC	1220 BHP	54.5	137,950	7.5	1.3407	2,542.5	0.9996	4
1250DFLC	1635 BHP	64.6	137,950	8.9	1.3407	2,542.5	0.9996	2

Emission Factors From IPL Conversion Factors from AP-42					Emission Factors from AP-42 Conversion Factors from AP-42				
Emission Factor lb/BHP-hr	PM	NOx	VOC	CO	Emission Factor in	PM	NOx	VOC	CO
750DFHA	1.98E-04	1.81E-02	5.70E-04	2.65E-04	lb/MMBtu	0.10	3.20	0.10	0.85
900DFHC	1.76E-04	1.60E-02	3.97E-04	3.97E-04					
1250DFLC	1.76E-04	2.58E-02	3.75E-04	1.34E-03					
Unit ID	Emission totals for engines of similar size				Unit ID	Emission Totals for engines of similar size			
	PM tons/yr	NOx tons/yr	VOC tons/yr	CO tons/yr		PM tons/yr	Nox tons/yr	VOC tons/yr	CO tons/yr
750DFHA	0.10	8.86	0.25	0.13	750DFHA	0.27	8.63	0.24	2.30
900DFHC	0.08	7.42	0.18	0.18	900DFHC	0.26	8.29	0.24	2.20
1250DFLC	0.05	8.01	0.12	0.12	1250DFLC	0.18	5.76	0.16	1.53
Total	0.23	24.28	0.56	0.44					

Engines will be grouped in a set of five 750 DFHA, a set of four 900 DFHC, plus a set of two 1250DFLC for a total of eleven engines at this substation.

Potential Throughput (hp-hr/yr) = hp \* 190 hr/yr per each of the engines at this location.



**Appendix A: Emission Calculations**  
**Internal Combustion Engines - Diesel Fuel**

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**Portable Diesel Generators (>600 HP)**  
**HAPs Emission Calculations per AP-42**  
**Company Name: Indianapolis Power & Light (Thompson Substation)**  
**Address City IN Zip: 4812 South Bridgeport Road, Indpls., IN**  
**Permit #: R097-12024-00377**  
**Reviewer: D. Foster**  
**Date: 03/17/00**

ID	Gal/hr	MMBtu/hr	Hr/yr
750	51.9	7.2	190
900	54.6	7.5	190
1000	64.6	8.9	0
1250	74.5	10.3	190

HAP Emissions for Single Engine:

HAP	Emission Factor lbs/MMBtu	Lb/hr 750	Lb/hr 900	Lb/hr 1000	Lb/hr 1250
Acetaldehyde	2.52E-05	1.80E-04	1.90E-04	2.24E-04	2.59E-04
Acrolein	7.78E-06	5.57E-05	5.86E-05	6.93E-05	7.99E-05
Benzene	7.76E-04	5.55E-03	5.84E-03	6.91E-03	7.97E-03
Formaldehyde	7.89E-05	5.65E-04	5.94E-04	7.03E-04	8.11E-04
Naphthalene	1.30E-04	9.30E-04	9.79E-04	1.16E-03	1.34E-03
Toluene	2.81E-04	2.01E-03	2.12E-03	2.50E-03	2.89E-03
Xylenes	1.93E-04	1.38E-03	1.45E-03	1.72E-03	1.98E-03

Engine Identification		750	900	1000	1250		
Engines used at this Location		5	4	0	2		
HAP	Emission Factor lbs/MMBtu	Lb/hr 750	Lb/hr 900	Lb/hr 1000	Lb/hr 1250	Emissions Lb/hr	Emissions Ton/yr
Acetaldehyde	2.52E-05	0.0009	0.0008	0.0000	0.0005	0.0022	0.0002
Acrolein	7.78E-06	0.0003	0.0002	0.0000	0.0002	0.0007	0.0001
Benzene	7.76E-04	0.0278	0.0234	0.0000	0.0159	0.0671	0.0064
Formaldehyde	7.89E-05	0.0028	0.0024	0.0000	0.0016	0.0068	0.0006
Naphthalene	1.30E-04	0.0047	0.0039	0.0000	0.0027	0.0112	0.0011
Toluene	2.81E-04	0.0101	0.0085	0.0000	0.0058	0.0243	0.0023
Xylenes	1.93E-04	0.0069	0.0058	0.0000	0.0040	0.0167	0.0016
Total HAP Emissions:						0.1290	0.0123

Potential Throughput (hp-hr/yr) = hp \* 190 hr/yr

## Appendix A: Emission Calculations Internal Combustion Engines

**Portable Diesel Generators (>600 HP)**  
**Toxic Analysis Results for IPL Diesel Generators**  
**Company Name: Indianapolis Power & Light (Thompson Substation)**  
**Address City IN Zip: 4812 South Bridgeport Road, Indpls IN**  
**Permit Number #: R097-12024-00377**  
**Reviewer: D. Foster**  
**Date: 3/17/00**

### HAP analysis of the 8-hour Threshold limit of 0.5% of the PEL

Pollutant (HAP)	Maximum Emission Rate g/s	Maximum Modeled Emission Rate g/s	Maximum Concentration ug/m3	.5% of PEL ug/m3	Exceeds Level
Acetaldehyde	0.0000378	0.00101	5.55	1800	No
Acrolein	0.0000126	0.0000126	0.0692	1.25	No
Benzene	0.00101	0.00101	5.55	16	No
Formaldehyde	0.000101	0.000101	0.555	4.65	No
Naphthalene	0.000164	0.00101	5.55	250	No
Toluene	0.000366	0.00101	5.55	3750	No
Xylenes	0.000252	0.00101	5.55	2175	No

### Preliminary Hazard Screening\*

Pollutant (HAP)	Maximum Modeled Emission Rate g/s	Maximum Annual Concentration ug/m3	1-In-Million Lifetime Risk Level ug/m3
Acetaldehyde	0.00101	0.59	0.5
Acrolein	0.0000126	0.0075	N/A
Benzene	0.00101	0.59	0.1
Formaldehyde	0.000101	0.059	0.08
Naphthalene	0.00101	0.59	N/A
Toluene	0.00101	0.59	N/A
Xylenes	0.00101	0.59	N/A

\*EPA estimates that, if an individual were to breathe air containing one of the above HAPs over his or her entire lifetime, that person would theoretically have no more than a one-in-a-million increased chance of developing cancer as a direct result of breathing air containing this chemical. Maximum generator run time will be limited to 225 hours (10 days) per year for each unit.

#### Assumptions:

- Assumed worst case conditions.

- Ran 11 generators at the Cumberland Substation all running with the highest KW ratings (1250 KW). This provided the largest emission rate.
- Since benzene had the highest emission rate, this was used for five of the HAPs.
- For Acrolein and Formaldehyde, their 1250 KW emission rates were used.
- Downwash was taken into account.
- Used 1994 met year.
- The closest trailer to the fence line was 7 meters.
- Fence line receptor spacing was set at 10 meters.
- A total of 554 receptors were used.
- This combination of generators is overly conservative. The maximum number of 1250 KW units at anyone site is 4. Only one site will have 11 units with only 2 1250 KW units at that site.